

## User's Manual



## FOX 4G DA8

### High Resolution Fiber Optic Distribution Amplifier

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# Precautions

## Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

### Caution

**Read Instructions** • Read and understand all safety and operating instructions before using the equipment.

**Retain Instructions** • The safety instructions should be kept for future reference.

**Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.

**Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

## Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

### Attention

**Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

**Conservier les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

**Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présents dans la documentation utilisateur.

**Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

## Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

### Achtung

**Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

**Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

**Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

**Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

## Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

### Precaucion

**Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

**Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.

**Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

**Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

### Warning

**Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

**Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

**Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

**Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

**Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

**Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

## Avertissement

**Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

**Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

**Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas éraillés ou pincés par des objets.

**Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

**Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

**Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

## Vorsicht

**Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

**Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

**Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegen gestellt werden können.

**Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

**Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

**Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

## Advertencia

**Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

**Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desconectar todos los cables de alimentación en el panel trasero del equipo, o desconectar el módulo de alimentación (si fuera independiente), o desconectar el cable del receptáculo de la pared.

**Protección del cable de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

**Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario debe acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

**Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

**Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

# Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

## USA, Canada, South America, and Central America:

Extron USA

1001 East Ball Road

Anaheim, CA 92805

U.S.A.

## Europe, Africa, and the Middle East:

Extron Europe

Hanzeboulevard 10

3825 PH Amersfoort

The Netherlands

## Asia:

Extron Asia

135 Joo Seng Road #04-01

PM Industrial Bldg.

Singapore 368363

Singapore

## Japan:

Extron Japan

Kyodo Building, 16 Ichibancho

Chiyoda-ku, Tokyo 102-0082

Japan

## China:

Extron China

686 Ronghua Road, Songjiang

District

Shanghai 201611

China

## Middle East:

Extron Middle East

Dubai Airport Free Zone

F12, PO Box 293666

United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

*If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.*

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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## 安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

### 注意

**阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。

**保存说明书** • 用户应保存安全说明书以备将来使用。

**遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。

**避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

### 警告

**电源** • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。

**拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

**电源线保护** • 妥善布线，避免被踩踏，或重物挤压。

**维护** • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

**通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

**锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

## FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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# 1

## **Chapter One**

### **Introduction**

About this Manual

About the FOX 4G DA8

Features

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*All trademarks mentioned in this manual are the properties of their respective owners.*

## WARNING

The FOX 4G DA8 outputs continuous invisible light, which may be harmful and dangerous to the eyes; use with caution.

- Do not look into the rear panel fiber optic cable connectors or into the fiber optic cables themselves.
- Plug the attached dust caps into the optical transceivers when the fiber optic cable is unplugged.

## About this Manual

This manual contains information about the two models of Extron FOX 4G DA8 fiber optic distribution amplifiers (DAs). The DA is available in two transmission modes, which define the transmission range of the DA:

- FOX 4G DA8 MM — A 1-input, 8-output multimode DA, with a range of up to 150 m (492') on the input and each output
- FOX 4G DA8 SM — A 1-input, 8-output singlemode DA, with a very long range of up to 30 km (18.75 miles) on the input and each output

## NOTE

The multimode and singlemode DAs are physically and functionally identical, with the exception of the effective range of transmission. In this manual, the terms "FOX 4G DA8" and "FOX DA" refer to a DA of either transmission mode.

## NOTE

Many products are compatible with the Extron FOX DA. They will be identified where appropriate, but not specifically described in this manual.

## About the FOX 4G DA8

The Extron FOX 4G DA8 (figure 1-1) product family consists of two models of ultra-high performance fiber optic distribution amplifiers.

The FOX DA accepts a proprietary input optical signal from a compatible Extron fiber optic transmitter (Tx). The optical signal can include video, audio, and one-way (transmitter-to-receiver [Rx]) RS-232 communications.

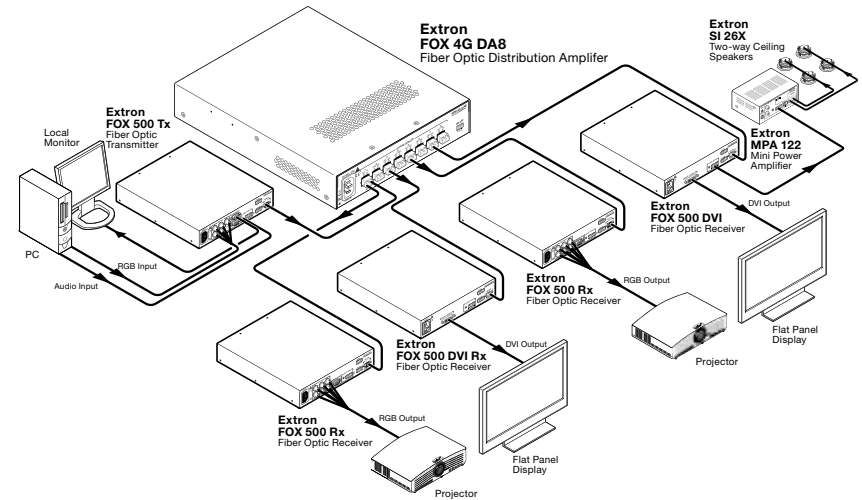


Figure 1-1 — Typical FOX 4G DA8 application

## NOTE

Compatible optical signals are digital signals from 2.0 Mbps through 4.25 Gbps that are sent and received via fiber optic SFP modules. The FOX DA supports all compatible optical signals, whether transmitted or received by an Extron fiber optic system component or not.

## NOTE

The video component of the signal from an Extron Tx can be either VGA - UXGA RGB video, digital visual interface (DVI) video, or SDI/HD-SDI video.

The serial component of the signal is for applications such as projector control and transmitter control of the receiver.

The FOX DA actively splits the proprietary signal into eight identical optical signals and outputs the signals on fiber optic cables to compatible receivers.

## NOTE

The eight optical outputs are identical.

## NOTE

The FOX 4G DA8 does not support transmission of a return (Rx-to-Tx) serial data stream.

## NOTE

The switcher can receive and send the proprietary signal from and to any compatible Extron fiber optic transmitter, receiver, or switcher. See appendix A, "Reference Information" for a list of compatible products.

The connected receiver(s) convert the proprietary signal(s) back to video (RGB, DVI, or SDI/HD-SDI, depending on the source transmitter and the receiver), audio, and serial RS-232 communication, and output the signals locally. For video resolutions up to 1600 x 1200, the receivers' video outputs are a perfect, pixel-for-pixel or digital recreation of the video signal input to the FOX DA via a transmitter.

### Features

**Ultra high performance** — Outputs up to eight perfect, pixel-by-pixel RGBHV or digital video transmissions to compatible receiver(s). The FOX DA can handle analog video resolutions up to 1600 x 1200 at 60 Hz. Higher resolutions can be transmitted, but with some loss of video quality.

**Optical input and outputs** — The FOX DA inputs and outputs the optical signal on LC video connectors.

**Active and individually isolated outputs** — The FOX 4G DA8 uses active signal splitting to maintain equal transmitter power to all outputs, maximizing distance capabilities by ensuring full availability of optical loss budget for each output.

**System video output** — When the optical input is from a FOX 500 or FOXBOX 4G Tx (rather than a FOX HD-SDI), the video portion of the optical video output can be decoded to either RGB video or DVI video, depending on the receiver connected.

**Rack mounting** — The unit is rack mountable in any conventional 19" wide rack, using Extron's full size rack shelf.

**Power** — The 100 VAC to 240 VAC, internal power supply provides worldwide power compatibility.



**FOX 4G DA8**

# Chapter Two

## Installation and Operation

Mounting the Unit

Rear Panel Features

Front Panel Features

System Operation

## Mounting the Unit

**CAUTION** *Installation and service must be performed by authorized personnel only.*

The 1U high, half-rack width unit can be placed on a tabletop, mounted on a rack shelf, or mounted under or through a desk or other furniture.

### Tabletop placement

Affix the four included rubber feet to the bottom of the unit and place it in any convenient location.

### Rack mounting

#### UL guidelines

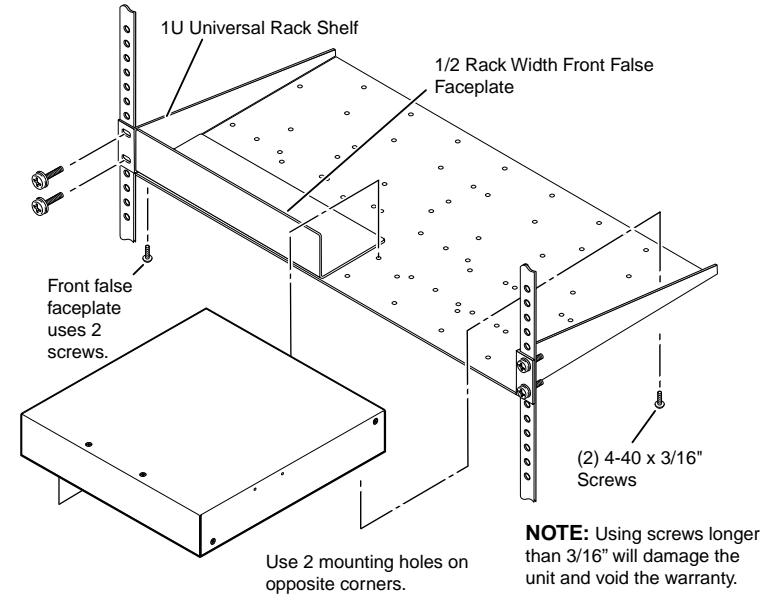
The following Underwriters Laboratories (UL) guidelines pertain to the installation of the FOX 4G DA8 into a rack (figure 2-1).

1. **Elevated operating ambient** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the +122 °F (+50 °C) maximum ambient temperature (T<sub>ma</sub>) specified by Extron
2. **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

## Mounting instructions

For optional rack mounting, mount the 1U high, half rack width unit on either of the following rack shelves:

- RSU 129 9.5" 1U universal rack shelf kit (part #60-190-01) (figure 2-1)
- RSB 129 9.5" 1U basic rack shelf (part #60-604-01)



**Figure 2-1 — Mounting the unit on a standard rack shelf**

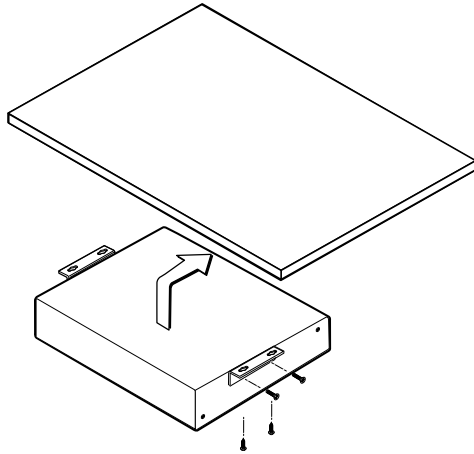
1. If installed, remove the feet from the bottom of the unit.
2. Mount the unit on either the left or right side of the shelf, using two 4-40 x 3/16" screws in opposite (diagonal) corners to secure the unit to the shelf.
3. Install a false faceplate or another unit onto the rack shelf.
4. Insert the shelf into the rack, aligning the holes in the shelf with those of the rack.
5. Secure the shelf to the rack using the supplied machine screws.



### Furniture mounting

Mount the 1U high, half-rack width unit under a desk or podium using the optional Extron MBU 125 under desk mounting kit (part #70-077-01) as follows:

1. If rubber feet were previously installed on the bottom of the unit, remove them.
2. Secure the mounting brackets to the unit with the machine screws provided (figure 2-2).



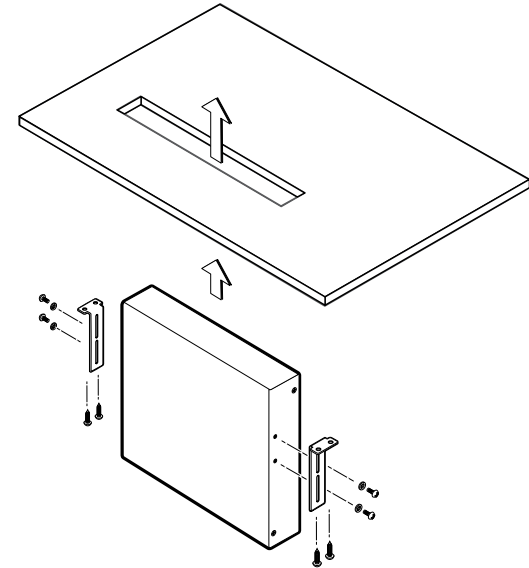
**Figure 2-2 — Under-desk mounting the unit**

3. Hold the unit with the brackets attached against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.
4. Drill four pilot holes, each 3/32" (2 mm) in diameter by 1/4" deep (6.3 mm) deep in the mounting surface at the marked screw locations.
5. Insert provided #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4" (6.3 mm) of the screw head protrudes.
6. Align the mounting screws with the slots in the brackets and place the unit against the surface, with the screws through the bracket slots.
7. Slide the unit slightly in or out, then tighten all four screws to secure the unit in place (figure 2-2).

### Through-desk mounting

Mount the 1U high, half-rack width unit through a desk or podium using the optional Extron MBD 129 through desk mounting kit (part #70-077-02) as follows:

1. If rubber feet were previously installed on the bottom of the unit, remove them.
2. Secure the brackets to the unit with the provided machine screws (figure 2-3). Leave the screws slightly loose.



**Figure 2-3 — Through-desk mounting the unit**

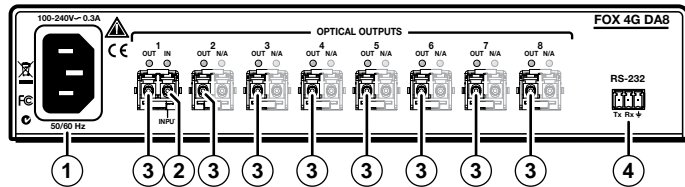
3. Hold the unit and brackets on the underside of the surface to which you are mounting the device and mark the four screw holes and the table material to be removed.
4. Remove the table material. Test the fit by inserting the front of the device through the hole. If necessary, use a rasp or coarse file to enlarge the hole.
5. Drill four pilot holes, each 3/32" (2 mm) in diameter by 1/4" deep (6.3 mm) deep, in the locations that you marked in step 3.
6. Using the provided #8 four wood screws, attach the brackets to the mounting surface.

7. Slide the device in or out until it is in the desired position. Tighten the screws installed in step 2.

If the screws are inaccessible to a screwdriver:

- a. Mark the location of the brackets relative to the screws.
- b. Remove the transmitter or receiver from inside the furniture.
- c. Tighten the screws.
- d. Replace the unit inside the surface (step 6).

### Rear Panel Features



**Figure 2-4 — FOX DA's connectors**

**WARNING** This unit outputs continuous invisible light, which may be harmful and dangerous to the eyes; use with caution. For additional safety, plug the attached dust caps into the optical transceivers when the fiber optic cable is unplugged.

**NOTE** Singlemode and multimode devices are **not** interchangeable. Ensure that you connect transmitting and receiving devices that are compatible with the FOX DA.

**NOTE** Ensure that you use the proper fiber cable for your system. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange jacket.

**NOTE** In this manual, the term "sending connector" refers to an LC connector on a transmitter or other device that outputs a fiber optic signal. The term "receiving connector" refers to an LC connector that receives an optical signal.

- ① **AC power connector** — Plug a standard IEC power cord into this connector to connect the FOX DA to a 100 VAC to 240 VAC, 50 or 60 Hz power source.

- ② **Input connector and LED** —

**NOTE** The input (right-hand) LC connector for transceiver block 1 is the only functional input connector. The right-hand LC connectors are not functional for transceiver blocks 2 through 8.

**Optical transceiver block 1 Input connector** — For one-way video, audio, and serial communications from the transmitter to the FOX DA (for distribution to the receiver(s), connect a fiber optic cable to the optical transceiver block 1's Input (right-hand) LC connector.

Connect the far end of this fiber optic cable to the sending connector on the transmitter or other compatible Extron device.

**Optical transceiver block 1 Input LED** — When lit, the link is active (light is received from the transmitter).

**NOTE** The input (right-hand) LED indicates the light link for transceiver block 1. The right-hand LEDs for transceiver blocks 2 through 8 may light, but do not indicate an input to that connector.

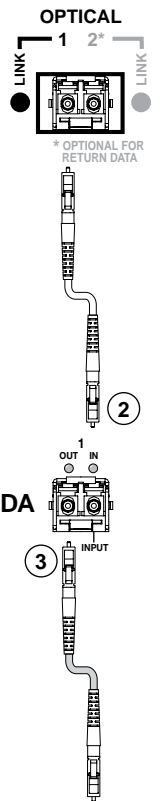
- ③ **Output connectors and LEDs** —

**Output connectors** — For one-way video, audio, and serial communications from the FOX DA to the receivers, connect up to eight fiber optic cables to the Output (left-hand) LC connectors on transceiver blocks 1 through 8.

Connect the far ends of these fiber optic cables to the receiving connectors on the receivers or other compatible Extron devices.

**Output LEDs** — These LEDs are always lit, whether the output is active (unmuted) or not.

### Transmitter



### Receiver

- ④ **RS-232 port** — For serial control of the DA, connect a host device, such as a computer, touch panel control, or RS-232 capable PDA, via this 3-pole captive screw connector. Figure 2-5 shows how to wire this connector.

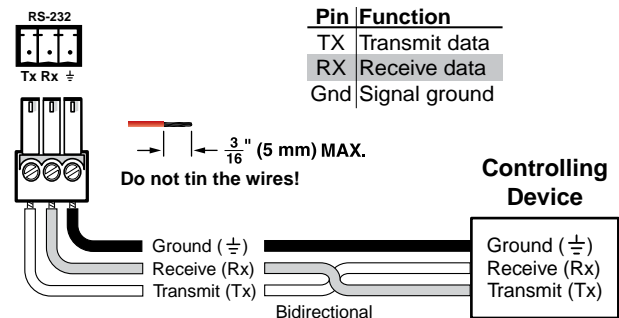


Figure 2-5 — RS-232 connectors

**NOTE** The length of exposed wires is critical. The ideal length is 3/16" (5 mm).

- If the stripped section of wire is longer than 3/16", the exposed wires may touch, causing a short circuit.
- If the stripped section of wire is shorter than 3/16", wires can be easily pulled out even if tightly fastened by the captive screws.

This port is RS-232 only, with the following protocols:

- 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- no flow control

Front Panel Features

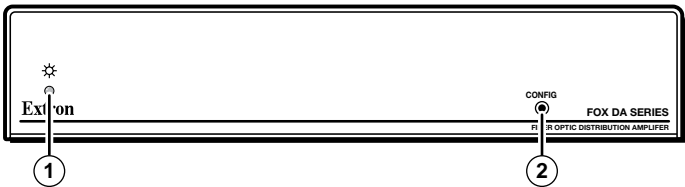
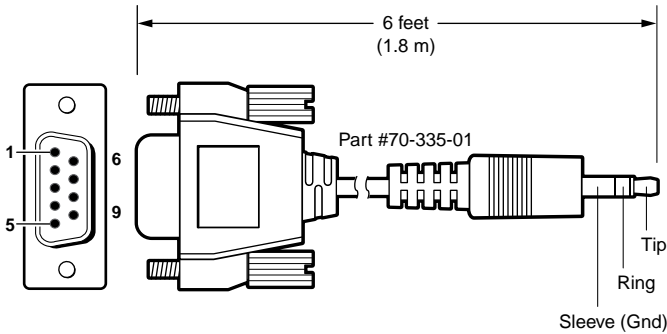


Figure 2-6 — FOX DA front panel features

- ① **Power LED** — This LED lights when power is applied to the unit.
- ② **Configuration port** — This 2.5 mm mini stereo jack serves the same serial communications function as the rear panel RS-232 port, but is easier to access than the rear port after the unit has been installed and cabled. The optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part #70-335-01 (figure 2-7), can be used for this connection.



9-pin D	Connection	TRS Plug
Pin 2	Computer's RX line	Tip
Pin 3	Computer's TX line	Ring
Pin 5	Computer's signal ground	Sleeve

Figure 2-7 — Optional 9-pin TRS RS-232 cable

This port is RS-232 only, with the following protocols:

- 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- no flow control

**NOTE** *The maximum distance from the FOX DA to the controlling device can vary up to 200' (61 m). Factors such as cable gauge, baud rates, environment, and output levels (from the unit and the controlling device) all affect transmission distance. Distances of about 50' (15 m) are typically not a problem. In some cases, the unit may be capable of serial communications via RS-232 up to 250' (76 m) away.*

### System Operation

After the transmitter, the FOX DA, the receiver(s), and their connected devices are powered up, the system is fully operational. If any problems are encountered, ensure all traditional and fiber cables are routed and connected properly:

- Ensure that the video source and the display(s) are properly connected to the transmitter, the FOX DA, and the receiver(s), and that all equipment has power applied.
- Ensure that the rear panel Input monitoring LED (item ② on page 2-7) is indicating correctly for your system configuration.

**NOTE** *If problems persist, call the Extron S3 Sales & Technical Support Hotline. See the rear cover of this manual for the phone number in your region of the world.*



**FOX 4G DA8**

# Chapter Three

## Remote Control

Serial Ports

Simple Instruction Set Control

Windows®-Based Program Control

Serial Ports

The FOX DA has two serial ports that can be connected to a host device such as a computer running the HyperTerminal utility, an RS-232 capable PDA, or a control system. These ports make serial control of the DA possible. The serial ports are:

- The rear panel RS-232 port on a 3-pin captive screw connector
- The front panel Configuration (RS-232) port, a 2.5 mm mini stereo jack

The protocol for both ports is as follows:

- 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- no flow control

Rear panel RS-232 port

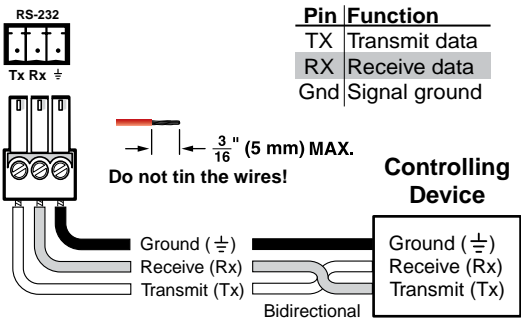
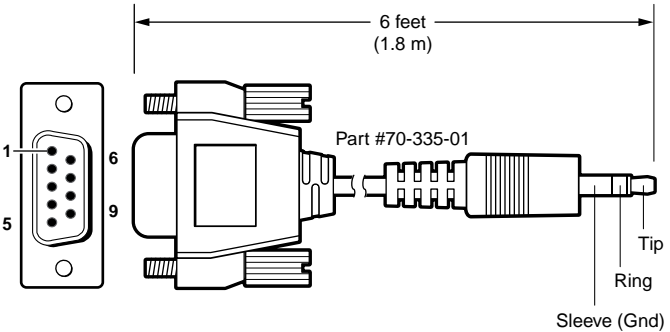


Figure 3-1 — RS-232 connector pin assignments

Front panel configuration port

The optional Extron 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part #70-335-01 (figure 3-2) can be used for connection to the Configuration port.



9-pin D	Connection	TRS Plug
Pin 2	Computer's RX line	Tip
Pin 3	Computer's TX line	Ring
Pin 5	Computer's signal ground	Sleeve

Figure 3-2 — Optional 9-pin TRS RS-232 cable

Simple Instruction Set™ Control

Host-to-interface communications

The Extron Simple Instruction Set (SIS) commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the unit executes the command and sends a response to the host device. All responses from the unit to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Start-up message

When a local event, such as a front panel operation or error condition, occurs, the unit responds by sending a message to the host. The unit-initiated messages are listed below:

(c) COPYRIGHT 2009, EXTRON ELECTRONICS FOX 4G DA8,

Vx.xx, 60-927-xx↵↵

The FOX DA issues the copyright message when it first powers on. Vx.xx is the firmware version number, 60-927-xx is the part number.

Error responses

When the unit receives a valid SIS command, it executes the command and sends a response to the host device. If the unit is unable to execute the command because the command is invalid or it contains invalid parameters, the unit returns an error response to the host. The error response codes are:

E10 - Invalid command↵

E12 - Invalid output number↵

E13 - Invalid range↵

Timeout

Pauses of 10 seconds or longer between command ASCII characters result in a timeout. The command operation is aborted with no other indication.

Using the command/response table

The command/response table begins on page 3-6. Lower case letters are acceptable in the command field. Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table below is for use with the command/response table.

ASCII to HEX Conversion Table																Esc 1B	CR 0D	LF 0A
Space 20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27	(	28	)	29
*	2A	+	2B	,	2C	-	2D	.	2E	/	2F	0	30	1	31	2	32	3
33	4	34	5	35	6	36	7	37	8	38	9	39	:	3A	;	3B	<	3C
=	3D	>	3E	?	3F	@	40	A	41	B	42	C	43	D	44	E	45	F
46	G	47	H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57	X	58	Y
59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F	`	60	a	61	b	62
c	63	d	64	e	65	f	66	g	67	h	68	i	69	j	6A	k	6B	l
6C	m	6D	n	6E	o	6F	p	70	q	71	r	72	s	73	t	74	u	75
v	76	w	77	x	78	y	79	z	7A	{	7B		7C	}	7D	~	7E	DEL 7F

Symbol definitions

Symbols (variables), defined below, are used in the command/response table on page 3-6. The symbols represent variables in the unit-initiated messages and the command/response table fields.

- ↵ = CR/LF (carriage return/line feed)
- = space
- [X1] = Output 1 through 8
- [X2] = Mute status 0 = off (unmuted) 1 = on (muted)
- [X3] = Firmware version v.vv
- [X4] = Transceiver module status 00000000 = no light input 10000000 = light input
- [X5] = Temperature nnnF = whole degree Fahrenheit
- [X6] = Transceiver module status 0 = no module installed 1 = multimode 2 = singlemode

## Command/response table for SIS commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
<b>Channel mute</b>			
<b>NOTE</b> The channel mute commands mute the data on the output only. The output continues to emit light.			
Mute output	[X1]*1B	Vmt[X1]*1 ←	Blank data on optical output [X1].
Unmute output	[X1]*0B	Vmt[X1]*0 ←	Output data on optical output [X1].
Show video mute status	[X1]B	[X2] ←	Output [X1]'s data output mute status is [X2] (0 = unmuted, 1 = muted).
Mute all outputs	1*B	Vmt1 ←	Blank data on all optical outputs.
Unmute all outputs	0*B	Vmt0 ←	Output data on all optical outputs.
Show mute status of all outputs	[Esc]VM ←	[X2]*[X2]*[X2]*[X2]* ... [X2]* ←	Show output 1 through output 8 mute status.
<b>Information requests</b>			
Information request	I	V01X08•A00X00 ←	V01X08 shows the number of available inputs (1) and outputs (8) for this product. A00X00 has no meaning for this product.
Show firmware version	Q	[X3] ←	The factory-installed FOX 4G DA8 controller firmware version is 1.23 (sample value only).
Example:	Q	1.23 ←	
Request part number	N	60-927- <i>nn</i> ←	
			<i>nn</i> indicates the transmission mode. 01 = multimode, 02 = singlemode.
Show input connections status	0LS	[X4] ←	0000000 = no light on the input, 10000000 = light received.
Show temperature	20S	[X5] ←	[X5] = degrees Fahrenheit.
Show transceiver module status	0*1I	[X6]*[X6]*[X6]*[X6]* ... [X6]* ←	Show all installed transceiver modules. 0 = none, 1 = multimode, 2 = singlemode.

## Windows®-Based Program Control

The Extron FOX Extender program, which communicates with the FOX DA via the unit's rear panel RS-232 port or front panel Configuration port, provides an easy way to operate the DA.

The program is compatible with Windows 2000, Windows XP, or later. Updates to this program can be downloaded from the Extron Web site ([www.extron.com](http://www.extron.com)).

### Installing the software

The program is contained on the Extron Software Products CD-ROM, disk B. Install the software as follows:


1. Insert the CD-ROM into the drive. The installation program should start automatically. If it does not self-start, run Launch.exe from the CD.

The Extron software CD window appears (figure 3-3).



**Figure 3-3 — Software CD window**

2. Click the Software tab (figure 3-3).
3. Scroll to the desired program and click Install (figure 3-4).

• FOX Extenders	79-523-01	1.2	Dec 4, 2008	3.7 MB	Install
Control software for the FOX Extenders.					
 Release Notes					

**Figure 3-4 — Software installation**



- Follow the on-screen instructions. By default, the Windows installation creates a C:\Program Files\Extron\FOX\_Extenders directory, and it places the following four icons into a group folder named "Extron Electronics\FOX Extender WCP":
  - Check for FOX Extender updates
  - FOX Extender WCP
  - FOX Extender Help
  - Uninstall FOX Extender WCP

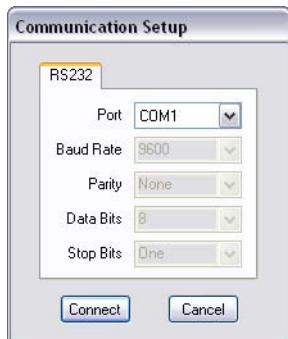
### Starting the program

Start the Extron FOX Extender program as follows:

- Connect a Windows-based computer to either of the DA's serial ports. See chapter 2, "Installation and Operation", for more details.
- Click **Start > Programs > Extron Electronics > FOX Extender WCP > FOX Extender WCP**.



The Communication Setup window appears (figure 3-5).



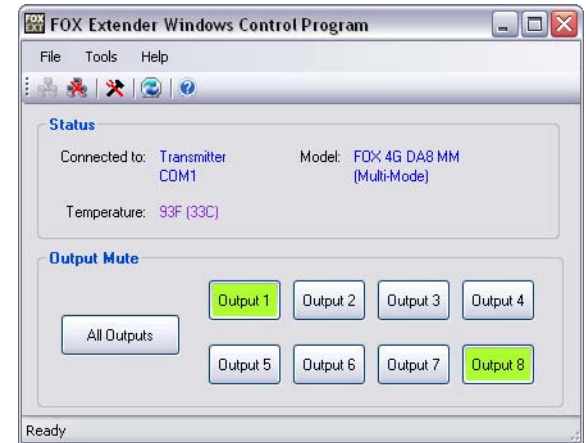
**Figure 3-5— Communication Setup window**

- Select the Com port to which your DA is connected. Click **OK**.

The FOX Extender program window appears (figure 3-6).

Mute or unmute individual outputs or all outputs by clicking the appropriate buttons.

**NOTE** The channel mute command mutes the data on the output only. The output continues to emit light.



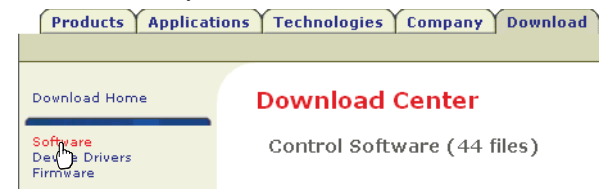
**Figure 3-6 — FOX Extender program window**

### Firmware upgrade

Firmware can be upgraded via the unit's front panel Configuration port **only**, using the Extron Firmware Loader utility from the FOX Extender program.

Upload replacement firmware as follows:

- Visit the Extron web site, [www.extron.com](http://www.extron.com), click the **Download Center** tab, and then click the **Firmware** link (figure 3-7). Select the appropriate firmware file(s) to download and copy it (them) to your computer. Note the folder to which you save the firmware file(s).

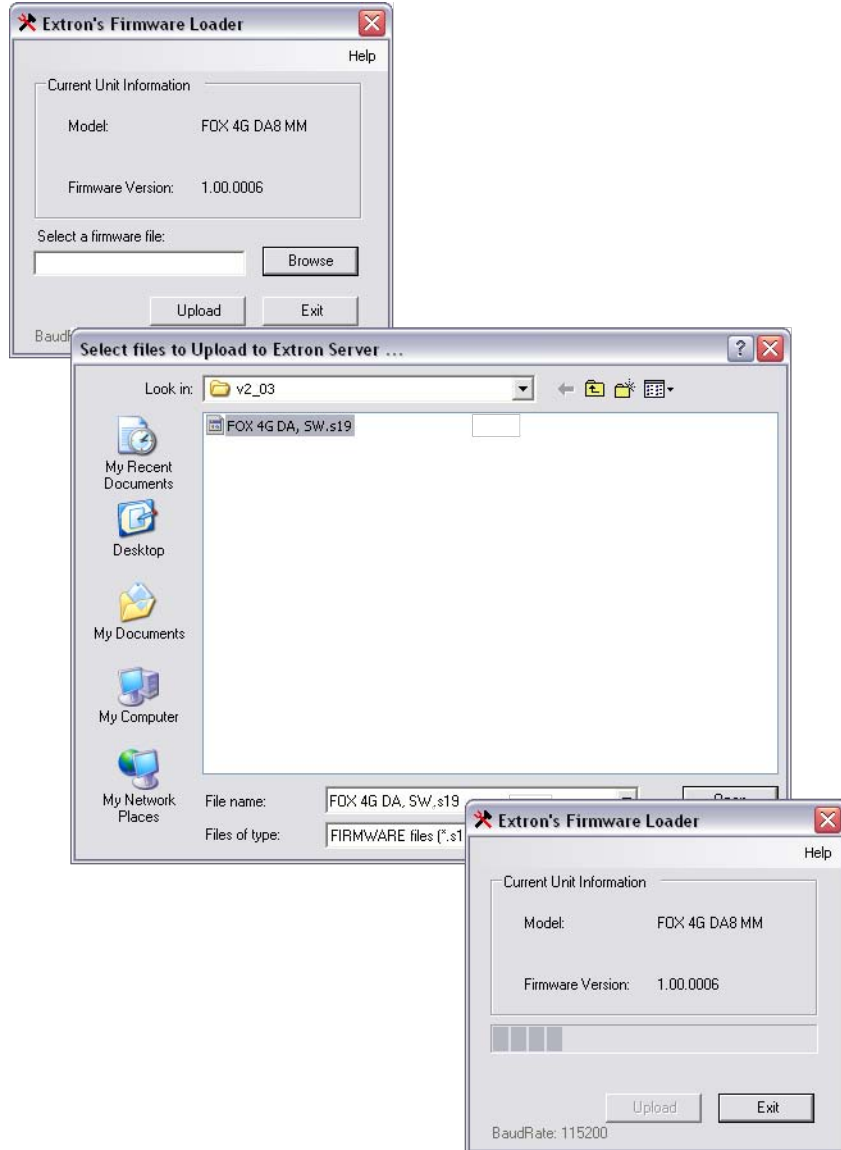


**Figure 3-7 — Location of firmware upgrade files**

- In the Windows Explorer or other file browser, double-click the downloaded executable (\*.exe) file(s) to self-extract the firmware file(s).
- Connect a Windows-based computer to the front panel Configuration port of the unit to be updated. See chapter 2, "Installation and Operation", for more details.
- Start the FOX Extender program. See "Starting the program", on page 3-8.

## Remote Control, cont'd

- Click **Tools > Update Firmware**. The Extron Firmware Loader appears (figure 3-8).



**Figure 3-8 — Firmware upload**

- Click **Browse**. The open file window appears.
- Navigate to the folder where you saved the firmware upgrade file. Select and open (double-click) the file. The Firmware Loader returns to the top.

**NOTE** *Valid firmware files must have the file extension ".BIN". Any other file extension is not a firmware upgrade for your FOX DA.*

- Click **Upload**. The File Loader reports, "This process could take several minutes. Please wait.." and then displays the status of the upload.
- When the Firmware Loader reports, "Transfer complete!", click the **Exit** button.
- Cycle the FOX DA's power.



# A

## **Appendix A**

### **Reference Information**

Specifications

Part Numbers

Reference Information

Specifications

Optical specifications

**NOTE** These amplifiers are class 1 laser products. They meet the safety regulations of IEC-60825, FDA 21 CFR 1040.10, and FDA 21 CFR 1040.11.

Number/type	
Input.....	1 singlemode or multimode fiber optic
Output.....	8 singlemode or multimode fiber optic
Connectors .....	8 LC connectors
Operating distance.....	30 km (18.75 miles) with singlemode (SM) cables 0.15 km (492') with multimode (MM) cables

**NOTE** Operating distance is approximate. These are typical distances. The maximum distance may be greater than these typical numbers depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.

Nominal peak wavelength.....	850 nm for MM model, 1310 nm for SM model
Data rate .....	4.25 Gbps
Transmission power	
Singlemode.....	-5 dBm, typical
Multimode.....	-5 dBm, typical
Maximum receiver sensitivity	
Singlemode.....	-18 dBm, typical
Multimode.....	-12 dBm, typical
Optical loss budget	
Singlemode.....	13 dB, maximum
Multimode.....	7 dB, maximum

Control/remote

Serial control ports.....	1 RS-232, 3.5 mm captive screw connector, 3 pole (rear panel) 1 RS-232, 2.5 mm mini stereo jack (front panel)
Baud rate and protocol.....	9600 baud, 8 data bits, 1 stop bit, no parity

Serial control pin configurations.	Captive screw connector: 1 = TX, 2 = RX, 3 = GND Mini stereo jack: tip = TX, ring = RX, sleeve = GND
Program control.....	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™)

General

Power .....	100 VAC to 240 VAC, 50-60 Hz, 20 watts, internal
Temperature/humidity .....	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling .....	Convection, vents on top and sides
Mounting	
Rack mount .....	Yes, with optional 1U, 9.5" deep rack shelf
Furniture mount.....	Yes, with optional under-desk mounting kit and through-desk mounting kit
Enclosure type .....	Metal
Enclosure dimensions.....	1.7" H x 8.7" W x 9.5" D (1U high, half rack wide) (4.3 cm H x 22.1 cm W x 24.1 cm D) (Depth excludes connectors.)
Product weight .....	2.3 lbs (1 kg)
Shipping weight .....	4 lbs (2 kg)
Vibration.....	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety.....	CE, CUL, UL
EMI/EMC .....	CE, C-tick, FCC Class A, FDA Class 1, ICES, VCCI,
MTBF.....	30,000 hours
Warranty .....	3 years parts and labor

**NOTE** All nominal levels are at ±10%.

**NOTE** Specifications are subject to change without notice.

Part Numbers

FOX 4G DA8 part numbers

The FOX 4G DA8 is available in a singlemode (SM) and a multimode (MM) model:

FOX 4G Models	Part number
FOX 4G DA8 SM	60-927-02
FOX 4G DA8 MM	60-927-01

Included parts

These items are included in each order for a FOX 4G DA8:

Included parts	Part number
IEC power cord	
3-pole captive screw audio connector	
Installation guide	
Extron Software Products CD (FOX Extender program)	
(1) 10' LC-LC duplex patch cables (SM or MM, depending on the model)	

Optional accessories

Accessories	Part number
9-pin D to 2.5 mm mini jack TRS RS-232 cable	70-335-01
RSU 129 9.5" 1U universal rack shelf kit	60-190-01
RSB 129 9.5" 1U basic rack shelf	60-604-01
MBU 125 under desk mounting kit	70-077-01
MBD 129 through desk mounting kit	70-077-02

Compatible equipment

The FOX 4G DA8 is compatible with a variety of Extron fiber optic receivers and matrix switchers, as shown below:

Fiber optic RGB video models	Part number
FOX 500 (RGB) Tx/Rx SM (set)	60-746-02
FOX 500 (RGB) Tx SM (individual unit)	60-746-12
FOX 500 (RGB) Rx SM (individual unit)	60-746-22
FOX 500 Tx/Rx (RGB) MM (set)	60-746-01
FOX 500 Tx (RGB) MM (individual unit)	60-746-11
FOX 500 Rx (RGB) MM (individual unit)	60-746-21
FOXBOX 4G Tx VGA SM	60-934-12
FOXBOX 4G Rx VGA SM	60-934-22
FOXBOX 4G Tx VGA MM	60-934-11
FOXBOX 4G Rx VGA MM	60-934-21

FOX 4G DVI models	Part number
FOX 500 DVI Tx SM (individual unit)	60-859-12
FOX 500 DVI Rx SM (individual unit)	60-859-22
FOX 500 DVI Tx MM (individual unit)	60-859-11
FOX 500 DVI Rx MM (individual unit)	60-859-21
FOXBOX 4G Tx DVI SM	60-935-12
FOXBOX 4G Rx DVI SM	60-935-22
FOXBOX 4G Tx DVI MM	60-935-11
FOXBOX 4G Rx DVI MM	60-935-21

FOX 2G models	Part number
FOX 2G Tx AV SM	60-941-12
FOX 2G Rx AV SM	60-941-22
FOX 2G Tx AV MM	60-941-11
FOX 2G Rx AV MM	60-941-21

FOX HD-SDI models	Part number
FOX HD-SDI SM	60-901-01
FOX HD-SDI MM	60-900-01

# Reference Information, cont'd

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FOX 4G Matrix 14400 switcher	Part number
FOX 4G Matrix 14400 enclosure	60-969-01
Singlemode I/O card	70-771-02
Multimode I/O card	70-771-01

Other fiber optic models	Part number
FOX 4G SW8 SM	60-984-02
FOX 4G SW8 MM	60-984-01
FOX 500 DA6 SM	60-863-02
FOX 500 DA6 MM	60-863-01